COMMENTS AND RESPONSE

In view of the comments below, Applicants respectfully requests that the Examiner reconsider the present application including rejected claims, as amended, and withdraw the claim rejections.

Specification

By this response the applicants have amended the specification to update the status of the related applications mentioned in the specification by filling in all known serial numbers.

Claim Objections

The Examiner has objected to claims 1-8 because of an informality. In particular, she noted that the acronym "UWB" should be spelled out as it appears the first time in the claim.

By this response, Applicants have amended claim 1 to spell out that the term UWB stands for ultrawide bandwidth, as is clearly set forth in the specification (e.g., page 2, line 27.) Applicants have made similar amendments to claims 9 and 17.

These amendments are being made solely to clarify what the acronym UWB stands for, as would be clearly understood from Applicants' specification, and in no way serves to further limit the scope of the claims.

Based on these amendments, Applicants respectfully request that the Examiner withdraw the objection to claims 1-8.

Claim Rejections - 35 USC § 103

The Examiner has rejected claims 1-6, 9-14, and 17 under 35 U.S.C. § 103(a) as being allegedly unpatentable over United States Patent No. 6,603,818 to Dress, Jr. et al. ("Dress") in

view of United States Patent No. 6,603,818 to Davidovici et al. ("Davidovici"). Applicants respectfully traverse this rejection.

Claim 1 recites selecting a detecting arm to identify the phase based on the correlation function; claim 9 recites a selector configured to select a detecting arm to identify the phase based on the correlation function; and claim 17 recites a means for selecting a detecting arm to identify the phase based on the correlation function. Nothing in Dress or Davidovici, alone or in combination, discloses or suggests these features.

In particular, Davidovici does not disclose or suggest selecting a detecting arm to identify a phase based on a correlation function. The recited step of selecting (or the recited selector or the recited means for selecting) implies that there are multiple arms to choose from, each of which could identify the phase, if selected. However, Davidovici only discloses the use of one detection arm, albeit one with an in-phase path (See, e.g., elements 31, 33, 35, and 38 in Fig. 1 of Davidovici) and a quadrature-phase path (See, e.g., elements 32, 34, 37, and 39 in Fig. 1 of Davidovici).

Nevertheless, the separate in-phase (I) and quadrature-phase (Q) paths do not correspond to separate detecting arms, and are not selected individually by the circuit in Davidovici to identify the phase of an incoming ultrawide bandwidth signal. The I and Q paths simply process in-phase and quadrature phase components of a single received signal (See, e.g., Davidovici, column 8, lines 42-45.) Nothing in Davidovici selects either the I or Q path. Rather, an in-phase-start-data signal and a quadrature-phase-start-data signal are demodulated by demodulator 41, and can be used as an initial timing signal for controlling when the diversity combiner 42 combines the output from the demodulator 41 for the respective signals from in-phase-symbol-matched filter 35 and the quadrature-phase-symbol-matched filter 37. (See, e.g., Davidovici,

column 10, lines 29-36.) Thus, as shown in Davidovici, the outputs of the I and Q paths are combined, a function quite different from selecting.

Furthermore, by definition the phases of the I and Q paths are 90 degrees apart from each other. Thus it would not be efficient or desirable to use the I and Q paths separately to identify phase. One would always be 90 degrees off from the other, and so no advantage would be obtained from any separate monitoring.

Therefore, as shown above, the I and Q paths disclosed in Davidovici are not individually selected and cannot be considered "detecting arms", as described in Applicant's specification. In addition, Davidovici does not provide any other teachings for using multiple arms for phase detection. And so nothing in Davidovici discloses or suggests selecting a detecting arm to identify the phase of an incoming UWB signal, as recited in claim 1. For similar reasons Davidovici does not disclose or suggest a selector configured to select a detecting arm to identify the phase of an incoming UWB signal, as recited in claim 9, or a means for selecting a detecting arm to identify the phase of an incoming UWB signal, as recited in claim 17.

Claims 2-4 depend variously upon claim 1 and are allowable for at least the reasons given above for claim 1. Claims 10-14 depend variously upon claim 9 and are allowable for at least the reasons given above for claim 1.

Based on at least the arguments given above, Applicants therefore respectfully request that the Examiner withdraw the rejection of claims 1-6, 9-14, and 17 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Dress in view of Davidovici.

The Examiner has rejected claims 7, 15, 20, and 24 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Dress in view of Davidovici, and further in view of United States Patent No. 6,650,693 to Park et al. ("Park"). Applicants respectfully traverse this rejection.

Claims 7 and 20 depend from claim 1 and are allowable for at least the reasons given above for claim 1; claims 15 and 24 depend from claim 9 and are allowable for at least the reasons given above for claim 9. Nothing in Park cures the deficiencies in Dress and Davidovici noted above.

In addition, Claim 7 recites comparing a first correlation value to a second correlation value to select the detecting arm with a higher correlation value; claim 15 recites a comparator configured to compare a first correlation value to a second correlation value to select a detecting arm with a higher correlation value; claim 20 recites comparing a first correlation value to a second correlation value to select a detecting arm with a higher correlation value; and claim 24 recites a comparator configured to compare a first correlation value to a second correlation value to select a detecting arm with a higher correlation value. Nothing in Dress, Davidovici, or Park, alone or in combination, discloses or suggests these features.

The Examiner has asserted that in Davidovici, elements 35-39 show the recited comparator and comparison step. However, this is not the function performed by elements 35, 37, 38, and 39 in Davidovici. As noted above, Davidovici discloses that an in-phase-start-data signal and a quadrature-phase-start-data signal are demodulated by demodulator 41, and can be used as an initial timing signal for controlling when the diversity combiner 42 combines the output from the demodulator 41 for the respective signals from in-phase-symbol-matched filter 35 and the quadrature-phase-symbol-matched filter 37. (See, e.g., Davidovici, column 10, lines 29-36.)

Nothing in this portion of Davidovici discloses or suggests comparing the values produced the in-phase-signal-matched filter 35 with the quadrature-signal-matched filter 37, or

selecting either the I path or the Q path in any way. Rather, Davidovici splits an incoming signal into I and Q paths, which are handled separately, but are used together for further processing.

In addition, claim 20 recites determining a first phase corresponding to the first correlation value, and finding a second correlation value for a second detecting arm that exceeds the predetermined threshold over a phase range beginning with the first phase. Similarly, claim 24 recites a calculator configured to find a first correlation value for a first detecting arm that exceeds a predetermined threshold and a second correlation value for a second detecting arm that exceeds the predetermined threshold over a phase range beginning with a first phase. Nothing in Dress, Davidovici, or Park, alone or in combination, discloses or suggests these features.

The Examiner has cited Davidovici, column 7, lines 60-67 as disclosing this feature. This passage simply notes that "the in-phase-start-data signal and the quadrature-phase-start data signal are combined as the start-data signal. Timing for sampling the output of the in-phase-symbol-matched means and the quadrature-phase-symbol-matched means for detecting the data-symbol-sequence signal is triggered, at a time delay, from the start-data signal. The time delay may be zero." But this does not disclose or suggest that a phase or time delay at all correspond to the in-phase-start-data signal and the quadrature-phase-start data signal, nor does it require that a second path be examined in a phase range beginning with a phase of the first path. Thus, Davidovici does not disclose or suggest "finding a second correlation value for a second detecting arm that exceeds the predetermined threshold over a phase range beginning with the first phase," as recited in claim 20, nor does it disclose a calculator configured to find ... a second correlation value for a second detecting arm that exceeds the predetermined threshold over a phase range beginning with a first phase, as recited in claim 24.

Based on at least the arguments given above, Applicants therefore respectfully request that the Examiner withdraw the rejection of claims 7, 15, 20, and 24 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Dress in view of Davidovici, and further in view of Park.

The Examiner has rejected claims 8 and 16 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Dress in view of Davidovici and Park, and further in view of United States Patent No. 6,493,360 to Nishimura ("Nishimura"). Applicants respectfully traverse this rejection.

Claims 8 depends from claim 7 and is allowable for at least the reasons given above for claim 7. Claim 16 depends from claim 15 and is allowable for at least the reasons given above for claim 15. Nothing in Nishimura cures the deficiencies in Dress, Davidovici, and Park discussed above.

In addition, claims 8 and 16 recite that the predetermined threshold is based on the desired bit error rate for the incoming UWB signal. Nothing in Dress, Davidovici, Park, or Nishimura alone or in combination, discloses or suggests this feature.

In particular, Nishimura discloses that a memory stores two or more threshold values for a movement average, and that after the two or more threshold values and the movement average are compared with each other, a correlation is taken by a UW correlation judgment circuit when the movement average is larger than the minimum values of the two or more threshold values. (See, e.g., Nishimura, abstract, lines 7-13.) However, nothing in Nishimura discloses or suggests that these thresholds are based on the desired bit error rates for an incoming signal. It is not sufficient for the bit error rates to be lower when a given threshold is met. Claims 8 and 16 require that the threshold *is based on* a desired bit error rate of the incoming UWB signal. No such relationship is disclosed or suggested in Nishimura.

Furthermore, Nishimura describes thresholds that are compared to movement averages (relating to the power level of the received signal), not to a correlation result. As a result, Applicants assert that there would not be a proper motivation to combine the teachings of Nishimura with those of Dress and Davidovici, as suggested by the Examiner. The fact that a movement average result is compared to a threshold value does not provide a teaching to compare a correlation result to a threshold value. And even if Nishimura did disclose that a threshold value relating to a movement average were set based on a desired bit error rate, this would also not provide a proper motivation to set a threshold value relating to a correlation result based on a desired bit error rate. Nothing in Nishimura provides any suggestion to modify a correlator circuit, and it would be improper to combine its teachings with circuits related to correlation circuits.

Based on at least the arguments given above, Applicants therefore respectfully request that the Examiner withdraw the rejection of claims 8 and 16 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Dress in view of Davidovici and Park, and further in view of Nishimura.

The Examiner has rejected claims 18, 19, 22, and 23 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Dress in view of Davidovici, and further in view of Nishimura. Applicants respectfully traverse this rejection.

Claims 18 and 19 depend from claim 1 and are allowable for at least the reasons given above for claim 1. Claims 22 and 23 depend from claim 9 and are allowable for at least the reasons given above for claim 9. Nothing in Nishimura cures the deficiencies in Dress and Davidovici discussed above.

In addition, claim 18 recites finding a first correlation value for a first detecting arm that exceeds a predetermined threshold; finding a second correlation value for a second detecting arm that exceeds the predetermined threshold; and comparing the first correlation value to the second correlation value to select the detecting arm with a higher correlation value. Similarly, claim 22 recites a calculator configured to find a first correlation value for a first detecting arm that exceeds a predetermined threshold and a second correlation value for a second detecting arm that exceeds the predetermined threshold; and a comparator configured to compare the first correlation value to the second correlation value to select the detecting arm with a higher correlation value. Nothing in Dress, Davidovici, or Nishimura, alone or in combination, disclose or suggest these features for at least reasons analogous to those given above for claims 7 and 15. Nothing in Nishimura cures the deficiencies in Dress and Davidovici discussed above.

In addition, claim 8 recites decreasing the predetermined threshold until the first correlation value is found, and claim 22 recites a subtractor configured to decrease the predetermined threshold until the first correlation value is found. Nothing in Dress, Davidovici, Park, or Nishimura alone or in combination, discloses or suggests this feature.

While Nishimura does disclose that when a movement average is smaller than a minimum threshold value, the minimum threshold value is decreased (See, e.g., Nishimura, column 11, lines 38-40), this does not suggest in any way altering a threshold used for a correlation result. The alteration of a threshold for a measurement of received power does not provide any suggestion to alter a threshold used to determine the applicability of a correlation result. A correlation result is not looking at total received power, but rather the degree of correlation between two signals. Criteria used in setting thresholds for these two situations may vary.

Claims 19 and 23 further recite that the predetermined threshold is based on the desired bit error rate for the incoming UWB signal. Nothing in Dress, Davidovici, or Nishimura alone or in combination, discloses or suggests this feature, for at least the reasons given above for claims 8 and 16.

Furthermore, Nishimura describes thresholds that are compared to movement averages (relating to the power level of the received signal), not to correlation results. As a result, Applicants assert that there would not be a proper motivation to combine the teachings of Nishimura with those of Dress and Davidovici, as suggested by the Examiner. As noted above. the fact that a movement average result is compared to a threshold value does not provide a teaching to compare a correlation result to a threshold value. Similarly, any parameters relating to the alteration of thresholds related to movement averages/power levels would be inapplicable to adjusting thresholds for correlation results. And even if Nishimura did disclose that a threshold value relating to a movement average were set based on a desired bit error rate, this would also not provide a proper motivation to set a threshold value relating to a correlation result based on a desired bit error rate. Nothing in Nishimura provides any suggestion to modify a correlator circuit, and it would be improper to combine its teachings with circuits related to correlation circuits.

Based on at least the arguments given above, Applicants therefore respectfully request that the Examiner withdraw the rejection of claims 18, 19, 22, and 23 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Dress in view of Davidovici, and further in view of Nishimura.

Conclusion

Accordingly, Applicants respectfully submit that the claims, as amended, clearly and patentably distinguish over the cited references of record and as such are deemed allowable. Such allowance is hereby earnestly and respectfully solicited at an early date. If the Examiner has any suggestions, comments, or questions, calls are welcome at the telephone number below.

Although it is not anticipated that any additional fees are due or payable, the Commissioner is hereby authorized to charge any fees that may be required to Deposit Account No. **50-1147**.

Respectfully Submitted,

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